be prevented by using the nozzles with small diameter.

Disadvantageously, however, the dry distillation gas can still get contaminated with a small amount of dust resulting from treating various types of waste and such dust would problematically block feed openings. It is ineffectual to simply enlarge the apertures of the porous nozzle in order to solve this problem, since it would cause backfiring that would blow back through the feed openings to the pyrolysis furnace and set off an explosion.

Also disadvantageously, a flow volume and a flow rate of the dry distillation gas may change at intake openings and the feed openings where a flow channel of the dry distillation gas varies in width and direction, thus the dust contained in the dry distillation gas would become solated and remain on the wall.

The solated material accumulated over an extended time period of continuous running of the apparatus becomes solid as time progresses, making it difficult to be removed. This can result in defects such as blocking of the feed openings, which consequently causes turbulent flow of the dry distillation gas to be supplied to the combustion chamber.

Still disadvantageously, an amount of the dry distillation gas to be supplied to the combustion chamber widely fluctuates, because of irregular generation of the dry distillation gas as a result of treating a mixture of various wastes. The flow rate of the dry distillation gas thus becomes turbulent, which could result in backfiring.

## SUMMARY OF THE INVENTION

The present invention intends to provide an improved combustion apparatus with a low risk of a fire and an explosion, in which a nozzle is prevented from being blocked with dust contained in dry distillation gas so that backfiring would not be caused.

In order to achieve this objective, a combustion apparatus for treating dry distillation gas as defined in claims 2 and 3 comprises: a gas pipe for supplying a combustion chamber with dry distillation gas generated during a waste treatment by means of dry distillation; an air pipe for supplying a front edge of said gas pipe with combustion air; and a combustion nozzle formed at said front edge of said gas pipe; wherein, said air pipe is centrally placed inside said gas pipe so as to construct a coaxial double pipe, and said combustion nozzle is formed as a circular combustion nozzle at said front edge of said gas pipe.

In the combustion apparatus for treating dry distillation gas as further defined in claim 2, said air pipe is supported to be axially rotatable, and scrapers are further provided with blades of said scrapers being in contact with a circumference surface of said air pipe.

In the combustion apparatus for treating dry distillation gas as also defined in claim 3, an inner circumferential surface of said front edge of said gas pipe is beveled inward at predetermined angle to form a narrowed portion, and said air pipe is supported to be movable back-and-forth relative to said narrowed portion.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a side view of a combustion apparatus for treating dry distillation gas according to the present invention. Fig.2 is a partially sectional plain view of the combustion apparatus for treating dry distillation gas according to the present invention. Fig.3 is a sectional view of Fig.2 along the line F-F. Fig.4 is a sectional view of Fig.2 along the line A-A. Fig.5 is a sectional view of Fig.2 along the line C-C. Fig 6 is a sectional view of Fig.5 along the line B-B. Fig.7 is a sectional view of Fig.2 along the line D-D. Fig.8 is a partially enlarged view of Fig.2. Fig.9 is a side view of a back-and-forth shifting apparatus.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention would be better understood when explained with references to the attached drawings. Fig.1 is a side view of a combustion apparatus for treating dry distillation gas 1 according to the present invention, and Fig.2 is a partially sectional plain view of the combustion apparatus for treating dry distillation gas 1.

The combustion apparatus for treating dry distillation gas 1 consists of a gas feeding unit 3 and an air feeding unit 4 with an air pipe 5 running through both the feeding units.

The gas feeding unit 3 is comprised of a gas pipe 30 and a gas feeding tower 31. The air pipe 5 is placed inside the gas pipe 30 in order to form a coaxial double pipe, which is inserted into a combustion chamber 20 to form a combustion nozzle.

The air feeding unit 4 comprises an outer cylinder 40, to which an air feeding tower 43 is jointed. The air feeding unit 4 is located so as that it shields air feeding apertures 50 made on the air pipe 5.

apparatus 6.

The finders 35 are mounted on the circumference of the gas pipe 30, enabling viewing of the pipe wall to which the dust contained in the dry distillation gas would adhere. The finders 35 may be equipped with the cleaning nozzles so that the pipe wall under the dry distillation gas atmosphere can be cleaned when the combustion apparatus is not in operation. At the same time, however, the present invention is arranged with the scrapers 33 being in contact with the circumference of the air pipe 5 that is rotatably supported by way of the support rollers 13 mounted on the movable base 11, the motor 15, and the transmission means 16, and therefore the dust accumulated on the pipe wall of the air pipe 5 can be scrapped off even while the dry distillation treatment is being operated.

The dust so scraped from the pipe wall are dropped in the tank B that is located on the lower side of the gas feeding tower 31, and can be regularly or continuously taken out therefrom.

The combustion air as previously described may be replaced by high-temperature steam. When the dry distillation gas is exposed to the high-temperature steam, it becomes separated and generates inert gas such as carbon dioxide, thereby producing the identical effects of the combustion air. Even advantageously, the volume of the gas to be finally exhausted can be significantly reduced, since the high-temperature steam does not contain nitrogen.

## INDUSTRIAL APPLICABILITY

As defined in claims 2 and 3, the present invention is constructed in a double pipe structure so that it forms the circular combustion nozzle, thereby achieving the feed opening for the dry distillation gas with sufficient width. With this arrangement, a large amount of the dry distillation gas can be evenly supplied and a blockage of the feed opening with dust pieces can be prevented, thereby lowering a danger of backfiring.

As further defined in claim 2, the present invention is constructed with the rotatable air pipe and the scrapers, with which the dust accumulated on the pipe wall can be scraped off while the apparatus is continuously being in operation. With this arrangement, the dry distillation gas can be stably supplied from the feed opening without any turbulence, thereby preventing backfiring.